Prototype Pattern Summary

History
The first example of the Prototype pattern was in Ivan Sutherland's Sketchpad System in 1964. In 1994, The Gang of Four popularized and codified the Prototype Pattern in their book "Design Patterns: Elements of Reusable Object-Oriented Software."

Definition
A prototype pattern is a creational design pattern that focuses on creating objects by copying an existing object, known as the "prototype," rather than creating new instances from scratch. In this pattern, a prototype object serves as a blueprint, and new objects are created by duplicating this prototype.

Key Components
Prototype: The interface or abstract class that declares the methods for cloning itself.
Concrete Prototype: The concrete classes that implement the Prototype interface or extend the Prototype abstract class.
Client: Responsible for creating new objects by requesting the prototype to clone itself.

Usages
Efficient Object Creation: When object creation is more efficient by copying an existing object rather than initializing a new one from scratch.
Reducing Subclassing: When a class cannot anticipate the type of objects it must create, the Prototype Pattern allows for new object creation without relying on subclasses.
Configuring Objects: Allows for configuring complex objects with different properties.

Pros	**Cons**
Object Creation Efficiency	Cloning Complexity
Flexible Object Creation	Need for Proper Initialization
Reduced Complexity	Maintaining Prototypes
Maintains Object Relationships	Potential for Inefficient Cloning

Two ways to implement Prototype Pattern in Java
Using the Cloneable Interface and Creating a Custom Clone Method

Cloning Strategies
Shallow Copy and Deep Copy

Prototype Registry: The Prototype Registry is a central repository or store that holds a collection of pre-defined prototype objects.

Real World Examples
1. Creating similar video game characters with different attributes.
2. Creating copies of GUI components (e.g., buttons, dialogs) to save time and resources when generating similar UI elements.
3. Cloning database records